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**Technical Support Document
Proposed Title V Permit Renewal
Delta and Pine Land Company
Permit # V20625.000**

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1. BACKGROUND

1.1 Process Description

The facility produces cotton seed for planting by delinting cotton seeds from the cotton ginning process. Anhydrous Hydrogen Chloride (HCl) is used in the delinting process. The process is seasonal with a potential maximum operating time of 5660 hours per year.

The source includes a delinter, baggers, cyclones, baghouses, and other equipment used to process and prepare raw cotton seed for use in planting the succeeding cotton crop.

Fuzzy cotton seed is loaded into a hopper and fed to a natural gas fired dryer to lower the moisture content. The dryer outputs to a charge cart, which feeds a batch of fuzzy seed through an auger assembly to the delinter. The solid plug of material in the feed auger effectively precludes emissions from that point. A cyclone system controls particulate emissions generated in the drying operation.

In the delinter, gaseous anhydrous HCl is applied to physically weaken the structure of the lint. The HCl is delivered in trailer-mounted, pressurized cylinders. The quantity of HCl applied is controlled such that it is completely, or nearly completely, consumed by the process. Previously, excess HCl was applied, and ammonia was used to neutralize the excess HCl. Under this permit, ammonia is no longer used in the process. Rather, a continuous weighing system provides a computerized control system with the data needed to meter the HCl applied to precisely correspond to the quantity of seed being processed. That results in all, or nearly all, of the HCl being neutralized or consumed in the reaction with the cotton lint.

Subsequently, the seed drops from the delinter into a pit hopper, and is lifted by an elevator and dropped into a two-stage buffing reel assembly. The mechanical action separates the weakened lint fibers from the seed. The buffing reels empty on a batch basis into an elevator hopper. The elevator lifts the seed into a clipper cleaner, which removes trash such as sticks and pebbles. An elevator moves the seed to surge tanks, where it is fed to gravity tables that separate good seed from culls. The good seed is delivered to storage tanks by an elevator. Another elevator transports the seed from the storage tanks to a weigh belt after which it is treated with insecticide and fungicide and bagged for use. In addition, calcium carbonate is included with the packed seed to neutralize any trace amounts of HCl that may be present.

The buffing reels include screens that separate the seed from the lint that is removed by mechanical abrasion. The lint solids are transported to the lint tank by an auger; the solid plug of material leaving the buffing reels effectively precludes emissions. A forced draft system collects airborne lint and other possible emissions from the delinter, the pit hopper, the elevator to the buffing reels, and the buffing reels themselves. Cyclones remove the bulk of the airborne lint from the flow, and down-stream baghouses further control any remaining particulate emissions.

A secondary force draft system also serves the delinter, as well as the gravity table. The delinter/gravity table exhaust system vents to the atmosphere through a cyclone. An additional exhaust flow captures emissions from the clipper cleaner, and exhausts through a dedicated cyclone. Finally, an additional set of cyclones control particulate emissions captured during the final seed treatment and packaging operations. Solids from the baghouses and all of the cyclones, other than the final treatment/packaging operations, are also conveyed to the lint tank.

To the extent that the gaseous HCl is not completely consumed in the reaction with the seed-borne lint, HCl emissions may escape through either the baghouses on the primary particulate control system, or the cyclone

on the secondary control system that serves the delinter.

Emissions of volatile organic compounds, VOCs, may occur from the chemicals used in treating the processed cotton seed. Negligible emissions of VOCs are emitted during the imprinting of seed packages.

In addition to the main delinting plant, the facility also includes a small foundation gin and a delinting system. The throughput of the gin is approximately 2 bales per hour with a maximum of 600 hours per year. The gin equipment and trash handling hopper are exhausted with a 8,000 scfm exhaust system. This exhaust system along with three cyclone separators operating in parallel control particulate emissions.

The small delinter has a throughput of two tons of fuzzy seed per hour with a maximum of 400 tons of seed per year. Sulfuric acid is used for the delinting process. A 5,000 scfm exhaust system serves the small delinter along with two cyclone separators operating in parallel to control particulate emissions.

1.2. Permit History

1.2.1 Initial Permit

On 2/9/2000 permit B30677.000 authorized operation of this facility as a "synthetic minor," with HCl emissions from the delinting process constituting the "critical" pollutant. Based on test-derived emission rates for HCl, that permit imposed operational limitations to assure "minor" status.

Even by the time that permit issued, the operator anticipated the need for a Title V permit, and filed such an application dated 11/19/1999. That application explained the seasonally-drive, inherent limitations on processing cotton seed, and posited emission potentials based on 5660 hours of operation per year. Title V permit V20611.000 was issued on 4/1/2001, and that permit corresponding allowed hours-of-operation limitations, resulting in potential HCl emissions at the "major source" level.

1.2.2. Revision V20611.R02

Revision "V20611.R02", issued on 3/15/05, removed the testing requirement for the Foundation Gin and Delinter exhaust systems due to problems associated with obtaining 3 consecutive 1 hour test runs on these exhaust fans given the operating constraints and intermittent operating schedule. The potential particulate matter emissions from the Foundation Gin and Delinter are relatively negligible. During this revision, the source submitted updated flow diagrams reflecting a more accurate description of the various exhaust systems and controls, even though no actual changes had been made to the facility. In accordance with these diagrams, several sections throughout the permit, including the Equipment List were revised to better depict the operations at this facility.

1.2.3. Revision "V20611.R01"

Issued on 9/3/03 authorized the upgrading of 2 old baghouses (019A,B) from 36 to 75-bag units. The baghouses operate in parallel to further control emissions from the two cyclones (18A, B) that control emissions from the elevator (012), the buffing reels (013), two bins (033, 047) and a box filler (048) from the main delinting facility. This revision also authorized an increase in the fan system, exhaust capacity of the trash handling hopper and cyclones of the foundation gin in the small delinting facility from 8,000 scfm to 15,000 scfm, which increased the PM10 PTE from 9 to 17 tpy. The applicant indicated that the change was not driven by a plan to increase throughput, but rather to avoid clogging and maintenance problems.

1.2.4. Renewal

Renewal V20625.000 reflects some small corrections and changes: Deletes SIP requirements that

have been rescinded or deleted, revises the opacity rule to reflect that as of April 2006, the standard will go from 40% to 20%¹, includes the fuel burning particulate emission requirement (§5-5-190) which was previously left out, and corrects typos.

1.3 Compliance/Enforcement History

There is no history of Notices of Violation or enforcement actions against this facility.

2. EMISSIONS

2.1 Actual Emissions (based on 2004 data)

	PM10	NOx	CO	VO C	SO2	HCl	Other HAPs	Total HAPs
Delinting	2.51	0	0	0	0	7.16	0	7.16
Dryers	0.01	0.26	0.22	0.01	1.56e-3	0	0	0
Mixing Tank/Treater	1.27	0	0	0.35	0	0	0.24	0.24
Foundation Gin & Delinter	0.29	0	0	0	0	0	0	0
TOTAL	4.08	0.26	0.22	0.37	0	7.16	0.24	7.4

2.2 Potential Emissions²

	PM10	NOx	CO	VO C	SO2	HCl	Other HAPs	Total HAPs
Delinting	3.83	0	0	0	0	10.9	0	10.9
Dryers	0.01	0.39	0.33	0.02	2.37e-3	0	0	0
Mixing Tank/Treater	1.93	0	0	0	0.53	0	1.13	1.13
Foundation Gin & Delinter	0.34	0	0	0	0	0	0	0
TOTAL	6.11	0.39	0.33	0.56	0	10.9	1.13	12.03

3. AMBIENT IMPACT ASSESSMENT

There are no changes associated with this permit renewal.

3.1. Criteria Pollutants

Criteria pollutants emitted by this facility include VOCs, PM₁₀, CO, SO_x, and NO_x which are regulated under the Clean Air Act ("CAA").

¹This change does not affect the cotton gin on site, since it is already regulated by a standard with opacity.

²The PTEs may be slightly different than those from the 1999 application. Applicant is now using site-specific emission factors for calculating actuals and potentials.

Maximum anticipated emissions from this facility do not reach the quantity-threshold that would trigger an obligation to analyze the additional impact on any nearby ozone non-attainment areas.

The relatively negligible emissions of PM₁₀ associated with production operations, and the limited quantities of PM₁₀, CO, SO_x or NO_x emissions associated with natural gas combustion, all allow for a cursory analysis to obviate any need to conduct an ambient impact analysis of those criteria-pollutant emissions to conclude that those emissions will not endanger the ambient air quality standards.

3.2. HAP Emissions

Hydrogen chloride (HCl), used in the delinting process, constitutes the predominant pollutant. Other HAPs are emitted by this facility in relatively negligible quantities.

While the provisions of the CAA do not mandate an ambient impact analysis for HAPs, prevailing local permitting practice does involve such an inquiry. That inquiry looks to both impact relative to the Arizona Ambient Air Quality Guidelines, as well as potential nuisance-level impacts.

- AQGL Analysis.

With an emissions potential of approximately 15³ tons HCl per year (5660 operating hours), and initially assuming a 100% capture ratio, and using an averaging time of one hour, a SCREEN3 analysis, as discussed more fully below, predicts a maximum ambient HCl impact of 184 µg./m³. That falls below the 1-hr Arizona Ambient Guideline of 210 µg./m³. Accordingly, to the extent that all HCl emissions are captured, anticipated emissions do not constitute a meaningful health threat.

Delinting occurs in a closed chamber exhausted to cyclones. The only HCl not captured is the small amount which is adsorbed on the surface of the seed. This would be less than one percent of the HCl used.

3.3. Nuisance Odor Analysis

No data was found on the nuisance odor impact of HCl. This is probably because odor detect level is higher than the toxicity level.

3.4. Conclusion

None of the pollutants from this facility, including HAPs, nitrogen oxides, carbon monoxide or particulate matter, will individually or collectively threaten the ambient standards, approach the Arizona ADHS-promulgated "AQGL" ("air quality guideline") values, or threaten a nuisance.

4. REGULATORY REQUIREMENTS AND CONSTRAINS

4.1 MACT Applicability

There are no changes associated with this permit renewal.

This facility does not fall within any of the MACT defined categories. Also, this source is an existing source and the only change made which subjected it to Title V permitting is an increase in the permitted hours of operation. Therefore this facility is exempt from the case-by-case MACT determination requirement.

4.2. Regulatory Emissions Limitations

³PTE Emissions have been recalculated closer to 10 tons per year. This would predict an approximate impact of 122.67 µg./m³

4.2.1 PM-10 Standard - Process industries

Using the maximum processing capacity of fuzzy cotton seed of 28,300 tpy at 5660 hours per year, the mass emission equation from PCAQCD Reg. 7-3-1.8 allows emissions of 12.0 pounds of particulates per hour from the facility. Potential emissions of PM (total particulates) are approximately 14.55 tpy @ 5660 hours per year = 5.14 pounds per hour. Since this is below 50 percent of the allowable, no compliance mechanism is included for this standard.

4.2.2 PM-10 Standard - Fuel burning equipment

This facility potentially includes 2 burners, both fired with natural gas rated at 2.5 and 2.6 MMBtu/hr.

The mass emission equation from PCAQCD Reg. 7-3-1.7 allows emissions of 3.57 pounds of particulates per hour. As a matter of common knowledge, the particulate emissions from natural gas combustion fall exclusively within the PM₁₀ size range. PM-10 emission factors from AP-42, 5th ed., Table 1.4-1 give PM-10 emissions as 0.0045 per hour million Btu of heating value. Since the calculated emissions are much less than the standard, no compliance mechanism is included for this standard.

4.2.3 Opacity

Natural gas equipment is by nature clean burning. Emissions from the delinting process are controlled by an extensive cyclone system. Based on performance tests and the experience of PCAQCD personnel during site inspections it is concluded that the possibility of an opacity of 20 percent or more from this equipment is essentially non-existent. For these reasons, the only required opacity compliance regimen is a periodic screening, with an "as needed" formal "Method 9" opacity observation triggered only by initial observation of actual opacity.

4.3 NSPS Applicability

No NSPSs apply to this facility.

5. INSTALLATION PERMIT; NSR COMPLIANCE

There are no changes associated with this permit renewal.

Although designated a "Class A" permit, that designation reflected the source's anticipated "major" status with regard to HAP/HCl emissions. The facility does not now, and has never constituted a "major emitting source" within the meaning of the District's PSD program.

6. REGULAR COMPLIANCE REPORTING

There are no changes associated with this permit renewal.

The emission factors determined from performance tests at this facility, actual production rate records, and mass balance analysis will be used to determine the HCl, PM10, and VOC emissions required by the periodic report. VOC and HAP emissions from seed treatment will be determined assuming all contained VOCs and HAPs are emitted.

7. PERMIT SHIELD

The following have been cited but excluded from the permit shield:

7.1. Open Burning §7-3-1.3

The current open-burning permit program essentially limits burning to small-scale burning of natural growth or landscaping trimmings. Open burning of other materials, or on a scale that generates emissions in excess of our 5.5#/day *de minimis* threshold, requires a separate permit or permit revision under §3-1-040 etc. Under an open burning permit, the Control Officer retains discretion to order a burning halt where the resulting smoke causes a nuisance.

Accordingly, the existing open-burning permit program is fully effective for purposes of protecting ambient air quality, as well as preventing nuisances.

However, since §7-3-1.3 is a "SIP" provision, it must be cited as an applicable requirement; since the provisions of the SIP-approved predecessor rule conflict with current District practice, enforcement of the older rule is now impractical. Therefore, we will exclude it from the permit shield in Permit §9.K.

7.2. All provisions already exempted from "federal enforceability."

8. COMPLIANCE ASSURANCE MONITORING (CAM)

The requirements of 40 CFR 64 do not apply to this facility, since no single emission unit satisfies the criteria of §64.2(a)(3). While pre-control particulate matter emissions from the whole facility are greater than 100 tpy, no single unit has pre-control device emissions of 100 tpy or more.